WHAT IS CLAIMED IS:

1. A completely inside the ear canal ("CIC") speaker comprising:

a diaphragm of diameter "D";

a magnet assembly of length "L" measured along the dimension orthogonal to the diaphragm, the magnet assembly defining a cylindrical magnetic gap; and

a voice coil having a first portion rigidly attached to the diaphragm and a second portion placed in the cylindrical magnetic gap, the voice coil having a depth "M" measured along the dimension orthogonal to the diaphragm surface;

wherein M>L and the ratio defined by D/M is less than one.

2. The CIC speaker as in claim 1, wherein the voice coil is formed of wire having a rectangular cross-section.

3. The CIC speaker as in claim 1, where the magnet assembly comprises a magnet having a high flux density.

4. The CIC speaker as in claim 1 wherein the CIC speaker has a first resonance frequency between 0 and 10 kHz, a second resonance frequency greater than or equal to10 kHz, and sufficient voice coil linear motion to produce at least 115 dB in a 0.5 cubic centimeter volume.

5. The CIC speaker as in claim 1 further comprising a closed-loop feedback controller adapted to provide linear motion of the voice coil during closure of the magnetic circuit between the voice coil and magnetic gap.

6. The CIC speaker as in claim 1 wherein "D" does not exceed 4 mm.

7. The CIC speaker as in claim 1, wherein the length of the CIC speaker does not exceed 11 mm.

8. A completely inside the ear canal ("CIC") speaker comprising:

a diaphragm of diameter "D";

a magnet assembly of length "L" measured along the dimension orthogonal to the diaphragm, the magnet assembly defining a cylindrical magnetic gap; and

a voice coil having a first portion rigidly attached to the diaphragm and a second portion placed in the cylindrical magnetic gap, the voice coil having a depth "M" measured along the dimension orthogonal to the diaphragm;

wherein L>M and the ratio defined by D/L is less than one.

9. The CIC speaker as in claim 8, wherein the voice coil is formed of wire having a rectangular cross-section.

10. The CIC speaker as in claim 8, where the magnet assembly comprises a magnet having a high flux density.

11. The CIC speaker as in claim 8 wherein the CIC speaker has a first resonance frequency between 0 and 10 kHz, a second resonance frequency great than or equal to10 kHz, and sufficient voice coil linear motion to produce at least 115 dB in a 0.5 cubic centimeter volume.

12. The CIC speaker according to claim 8 further comprising a closed-loop feedback controller to provide linear motion of the voice coil during closure of the magnetic circuit between the voice coil and magnetic gap.

13. The CIC speaker as in claim 8 wherein "D" does not exceed 4 mm.

14. The CIC speaker as in claim 8, wherein the length of the CIC speaker does not exceed 11 mm.

15. A CIC actuator comprising:

a housing having a length 11 mm or less and a diametrical dimension of 4 mm or less;

a first magnet assembly defining a first magnetic gap, the first magnet assembly located at an end of the housing and the first magnetic gap adapted to form a north-south orientation of magnetic poles;

a second magnet assembly defining a second magnetic gap, the second magnet assembly located opposite the first magnet assembly and the second magnetic gap adapted to form a south-north orientation of magnetic poles;

a diaphragm;

a voice coil surrounding the diaphragm; and

a flexible suspension element adapted to directly secure the diaphragm to the internal surface of the housing and to suspend the diaphragm between the first magnetic gap and the second magnetic gap;

wherein the diaphragm, the flexible suspension element, and the enclosure define a sealed cavity separating the front of the diaphragm and the back of the diaphragm and wherein the flexible suspension bisects the first and second magnet assemblies and the voice coil.

16. A CIC actuator comprising:

a housing having a length 11 mm or less and a diametrical dimension of 4 mm or less;

a magnet assembly defining a magnetic gap, the magnet assembly located at a first end of the housing;

a diaphragm connected to the sides of the housing by a first flexible suspension element, wherein the point of attachment of the first flexible suspension element to the diaphragm defines a first diaphragm segment and a second diaphragm segment, the first diaphragm segment situated in the magnetic gap and attached to the first end of the housing via a second flexible suspension element and the second diaphragm segment attached to a second end of the housing; and

a voice coil surrounding the second diaphragm segment.

17. A CIC actuator comprising:

a housing having a length 11 mm or less and a diametrical dimension of 4 mm or less;

a first diaphragm and second diaphragm of about the same size, wherein the first diaphragm and the second diaphragm are attached to the inside perimeter of the housing and to each other via a flexible suspension element; and wherein the first diaphragm and the second diaphragm are powered by a co mmon excitation signal.

18. The CIC actuator according to claim 13, further comprising:

an armature comprising a first end segment, a middle segment, and a second end segment;

a first voice coil surrounding the first end segment;

a second voice coil surrounding the second end segment;

a magnet assembly defining a magnetic gap, wherein the magnet assembly is disposed in the housing so as to locate the middle segment of the armature in the magnetic gap;

a first coupling member connecting the first segment to the first diaphragm; and

a second coupling member connecting the second segment to the second diaphragm;

wherein the first voice coil and second voice coil are adapted to receive a co mmon excitation signal simultaneously.

19. A CIC balanced armature actuator comprising

A housing having a length 11 mm or less and a diametrical dimension of 5 mm or less,

A sound producing diaphragm that is connected to an armature that moves in a permanent magnetic field by a connecting rod,

Where the sound producing diaphragm is acoustically exposed to the environment in which it operates via a sound port that has an opening at least 25% as large as the diaphragm surface area.